Kentucky Tech celebrates solar panel system erected on Russell ATC campus

On Tuesday, October 21, a special ribbon-cutting event was held to celebrate the completion of a "Solar Panel House," built on the grounds of Russell Area Technology Center in Russell, KY.

Guest speakers included Representative Rocky Adkins, House Majority Floor Leader; Representative Tanya Pullin, Dr. Susan Compton, Russell Independent superintendent; and Education and Workforce Development Cabinet Secretary Helen W. Mountjoy.

Over this past year, renewable and alternative energy stories have been headlined in the news across the nation. The topic is also being headlined in the Kentucky Tech system of schools. Why? Russell Area Technology Center (ATC) instructor Doug Keaton has made his electrical technology program a viable asset in studying alternative and renewable energy solutions.

The solar panel house is another first in the Kentucky Tech system. The previously constructed wind turbine and the new solar system will actually produce renewable energy to reduce costs this year by a conservative estimate of approximately $6,000.

"What Mr. Keaton and his students are doing is amazing," said Mountjoy. "They've taken basic instruction, added in cutting edge approaches to alternative energy, and come out with a program that is a model for others across the country."

Photo: Secretary Helen Mountjoy signs official photo of solar panel house flanked by E-3 team members Kameron Smith (l) and Derrick Colt (r). Back row: Adkins, Mr. Keith Parsons, Russell ATC principal; Greenup County judge executive Bobby Carpenter, Pullin and Keaton.

All visitors were asked to sign the photo for posterity. It will be framed and hung in the main hall outside of Mr. Keaton's classroom.

Doug Keaton:

"It is always satisfying to complete a project; but, it is especially gratifying when you see your students work continuously for 2 years to complete phases one and two of a three-phase project. It's even more awesome when you watch their faces light up as they try to help others understand the process of taking wind or sunlight to generate electricity and utilize that power in the school they attend.

"In my view, this is true education. We are teaching students how to apply academic concepts in real life projects. The hands-on technical skills reinforce what they have learned. There is genuine collaboration among teachers; and, our students are benefiting as a result.


Mr. Doug Keaton

"What we are doing at our area technology center is innovative because we are a secondary institution. The technology has been around for some time – it just hasn't been a focal point in the American education system. When a crisis erupts, people adapt. We are adapting by educating our students so they can understand global energy concerns. The difference is, we aren't just talking about the issues and concerns, we are making those front and center by having our students learn about and participate in a get well plan right here at home in Kentucky.

"We were honored to have Representatives Rocky Adkins and Tanya Pullin, Secretary Helen Mountjoy and Dr. Susan Compton participate in our ribbon cutting ceremony. We appreciate their willingness to spend time visiting our student displays. To us, it meant they were interested in what we are doing and what we have accomplished."

Majority Floor Leader Rocky Adkins:

"Over the last three years, I have talked about our country's need to break our dependence on foreign oil. I have said it is going to take all kinds of alternative energy sources - wind, solar, hydro and biomass - to help us achieve energy independence and that Kentucky can lead the way.

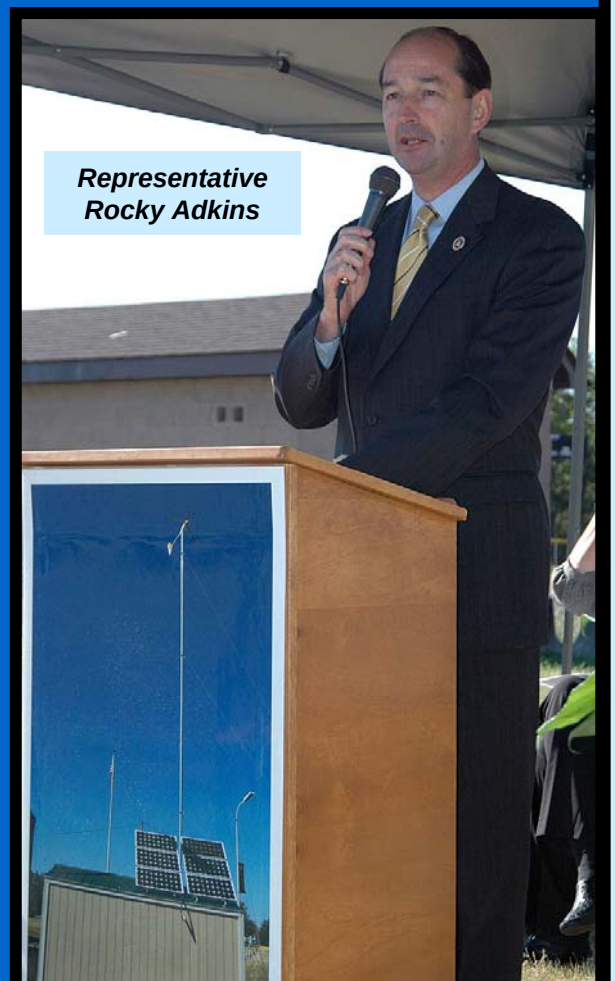
"I have sponsored - and the Kentucky General Assembly has passed - landmark energy legislation that encourages the use of our natural resources, research and development, and technologies to accomplish energy independence. We have some exciting projects happening around Kentucky right now because of this legislation.

"But just as exciting is the partnership with Mr. Keaton, the high school teachers, and the students that resulted in the solar panel project and last year's wind turbine project. These projects should be emulated by all Kentucky schools and could even be a national model.

"I have traveled around the country speaking about energy independence and Kentucky is actually being recognized as a leader in this arena because of innovative projects like this, legislation that is encouraging research and development, and people like Mr. Keaton.

"The added benefit of this project is the energy conservation philosophy being instilled in our students. Hopefully, this experience will foster a new generation of students from this area who will pursue degrees in energy related fields so they can help us find solutions to America's energy crisis.

"I applaud Mr. Keaton's leadership, the students' hard work, the administration's support and the collaboration with secondary and postsecondary institutions that have made this project a reality."



Representative Rocky Adkins

Representative Tanya Pullin:

"The work of the students at Russell Area Technology Center demonstrates how individuals can indeed generate electricity through wind or solar power and use it as the students use it to light and power their own school building.

"The energy crisis is one of the biggest and most difficult issues facing the United States today. It gives me hope that students at the high school level are thinking creatively about how to solve this crisis.

"Mr. Parsons, principal, and the administration of the school systems all support Mr. Keaton in his efforts to educate students in energy in a hands-on way.

"I congratulate the students of the Energy Team at the Russell Area Technology Center and Mr. Keaton for excellent work and creative vision in the face of our nation's energy crisis."

Representative Tanya Pullin


Dr. Compton

Dr. Susan Compton
Russell Independent School District:

"We believe this is a living example of what the Kentucky Education Reform Act is all about and we salute the accomplishments of what this pilot program has done for Kentucky and our nation as a whole.

"The Russell Area Technology Center and the Russell Independent Schools have made great strides in being leaders in elevating vocational-technical school involvement in energy efficiency. We applaud the success of the student energy systems, and what they have achieved in demonstrating learning at the highest level of academic integration.

"This is an exemplary national model supporting innovative efforts in energy efficiency."

"Peddle Power" The Energy Bike generates electricity for multiple devices mounted on a display board.

Photo: back row (l to r): Clifford Wells, OCTE area supervisor; Joe Aldrich, Russell HS honors physics instructor; and Keith Parsons, Russell ATC principal. Front row (l to r): Dr. Susan Compton, Russell Independent Schools superintendent; Doug Keaton, Russell HS AP math instructor Carol Stevens, Judy Ledford, Russell Bd of Education member; and Bobbie Hale, Russell Ind. district curriculum advisor.

Historical overview of project

Over his 11 years of teaching, Doug Keaton has always tried to incorporate real life projects into the curriculum. In his opinion, it helps students understand what they can do in the real world with the practical hands-on skills he teaches in his classroom.

He has been instrumental in bringing about a change in energy education by doing what he does best, "thinking outside of the box."

During the 2006-07 school year, Keaton became involved in a Tech Prep project to study alternative and renewable energy solutions. At that time, his focus was wind energy. During phase one, he and his student built a 1 Kw wind turbine generator and energy conservation display. The wind generator is now fully operational. Since that time, Keaton and his students have completed phase two – building a solar panel system that actually produces renewable energy. It too, is fully operational.

When phase two began, Keaton had to find a way to acquire and construct a solar panel system. He did. The project was made possible through the donation of a SIPS (structural insulated panel system) solar house from the Kentucky Solar Partnership and its director, Andy McDonald.

It had been stored on the Berea College campus. Keaton had to disassemble the SIPS before transporting it to the Russell ATC where the project became a reality. From the onset, students were involved in the modification and rebuilding of the structure – made entirely from recycled materials.

According to Keaton, renewable energy from both the wind turbine and solar panels work in the following manner:

"The power generated by either wind or solar panels goes into a charge controller that monitors the amount of power fed into a battery bank.

"There are 10 batteries that store electricity produced by the solar system and wind turbine generator. Six batteries store energy for the solar system and the wind turbine generator stores energy in four batteries. The batteries are connected to a radio and floodlight to prevent energy overload to the batteries.

"The energy stored in the battery bank then passes through an inverter that converts the useable DC voltage into AC voltage.

"From there, the energy is being used to light the hallway in the area technology center. And, the energy provides the power to monitor the entire system in the solar panel house."

At right: Doug Keaton and his group of students known as the E-3 (Efficient Electrical Energy) Team.

Throughout project phases one and two, Keaton has worked across academic boundaries with secondary and postsecondary instructors to connect academic core content and hands-on applications to energy education in his classroom.

Most recently, he has collaborated with Carol Stevens, Russell High School AP math instructor during this years' solar energy project.

"I just think it is awesome for the kids to be able to apply the mathematics into a real world scenario. Geometry and trigonometry are everywhere," says Stevens. "My students have been able to see how much math had to be used. And, as the data on the amount of energy is being collected, statistical procedures can then be applied to maximize when and how much energy is being produced. The possibilities of math are endless."

Because of the project's relevance, many in Kentucky and throughout the nation are now interested in what Keaton is doing, and have asked for a roadmap to emulate the projects his students have completed. Stay tuned for phase three – *biodiesel*.

At left: E-3 team members Shyler Elkins, Adam Bates and Jaron Bowen show off the mobile solar trainer they helped build.

At right: E-3 team member Daniel Cox explains the operational sequence of the control system.

Emerging energy projects in career and technical education

Not only are energy conservation and renewable energy sources a national concern, Doug Keaton has created a lot of interest in these subject areas over the past two years. An RFP was disseminated throughout Kentucky to help energy related programs emerge. Funding was allocated through the Carl D. Perkins Vocational Education Act. Five area technology centers and one locally operated career and technical center were awarded the following energy grants:

KY Tech - Boone Co. ATC: Michael Hockenberry, electrical technology instructor
Renewable-Alternative Energy Project Expansion – focus on wind energy.

KY Tech – C.E. McCormick ATC: Kelly McCormick, electrical technology instructor
Renewable-Alternative Energy Project Expansion – focus on wind energy.

KY Tech – J.D. Patton ATC: Tom Pitts, electrical technology instructor
Renewable Energy Curriculum Expansion – focus on wind energy. Expanding to solar power and hydroelectric generators.

KY Tech – Madison Co. ATC: Michael Sandlin, electrical technology instructor
Renewable Energy – focus on wind energy.

Magoffin Co. Career and Tech Center: Vince Minix, electrical technology instructor
Exploring Wind and Solar Energy.

KY Tech – Mason Co. ATC: David Collins, electrical technology instructor
Alternative Energy Program – focus on wind energy.

Good News Flash #258
By: Fran Dundon
Office of Career and Technical Education
Education and Workforce Development Cabinet
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